Research in Social and Administrative Pharmacy xxx (2017) 1–13

Contents lists available at ScienceDirect

Research in Social and Administrative Pharmacy

journal homepage: www.rsap.org

The degree of integration of non-dispensing pharmacists in primary care practice and the impact on health outcomes: A systematic review

Ankie C.M. Hazen, MSc [a, *], Antoinette A. de Bont, PhD [b], Lia Boelman, MSc [a], Dorien L.M. Zwart, MD PhD [a], Johan J. de Gier Prof [c], Niek J. de Wit Prof [a], Marcel L. Bouvy Prof [d]

[a] Department of General Practice, Julius Center for Health Sciences and Primary Care, University Medical Center Utrecht, Universiteitsweg 100, 3584 CG, Utrecht, The Netherlands
[b] Institute of Health Policy and Management, Erasmus University, Burgemeester Oudlaan 50, 3062 PA, Rotterdam, The Netherlands
[c] Department of Pharmacotherapy, Epidemiology and Economics, University of Groningen, Antonius Deusinglaan 1, Building 3214, 9713 AV, Groningen, The Netherlands
[d] Department of Pharmaceutical Sciences, Utrecht University, Universiteitsweg 99, 3584 CG, Utrecht, The Netherlands

ARTICLE INFO

Article history:
Received 23 November 2016
Received in revised form
7 April 2017
Accepted 20 April 2017

Keywords:
Clinical pharmacist
Integrated care
Primary health care
Systematic review

ABSTRACT

Background: A non-dispensing pharmacist conducts clinical pharmacy services aimed at optimizing patients individual pharmacotherapy. Embedding a non-dispensing pharmacist in primary care practice enables collaboration, probably enhancing patient care. The degree of integration of non-dispensing pharmacists into multidisciplinary health care teams varies strongly between settings. The degree of integration may be a determinant for its success.

Objectives: This study investigates how the degree of integration of a non-dispensing pharmacist impacts medication related health outcomes in primary care.

Methods: In this literature review we searched two electronic databases and the reference list of published literature reviews for studies about clinical pharmacy services performed by non-dispensing pharmacists physically co-located in primary care practice. We assessed the degree of integration via key dimensions of integration based on the conceptual framework of Walshe and Smith. We included English language studies of any design that had a control group or baseline comparison published from 1966 to June 2016. Descriptive statistics were used to correlate the degree of integration to health outcomes. The analysis was stratified for disease-specific and patient-centered clinical pharmacy services.

Results: Eighty-nine health outcomes in 60 comparative studies contributed to the analysis. The accumulated evidence from these studies shows no impact of the degree of integration of non-dispensing pharmacists on health outcomes. For disease specific clinical pharmacy services the percentage of improved health outcomes for none, partial and fully integrated NDPs is respectively 75%, 63% and 59%. For patient-centered clinical pharmacy services the percentage of improved health outcomes for none, partial and fully integrated NDPs is respectively 55%, 57% and 70%.

Conclusions: Full integration adds value to patient-centered clinical pharmacy services, but not to disease-specific clinical pharmacy services. To obtain maximum benefits of clinical pharmacy services for patients with multiple medications and comorbidities, full integration of non-dispensing pharmacists should be promoted.

1. Introduction

The aging of the population results in increasingly complex medication-related needs.[1] To sustain the economic viability of health care the majority of elderly patients should be treated in primary care. To incorporate specific pharmaceutical expertise,

* Corresponding author. Universiteitsweg 100, PO box 85500, Room Str. 6.101, 3508 GA, Utrecht, The Netherlands.
E-mail addresses: a.c.m.hazen@umcutrecht.nl (A.C.M. Hazen), debont@bmg.eur.nl (A.A. de Bont), lboelman@gmail.com (L. Boelman), d.zwart@umcutrecht.nl (D.L.M. Zwart), degiercs@wxs.nl (J.J. de Gier), n.j.dewit@umcutrecht.nl (N.J. de Wit), m.l.bouvy@uu.nl (M.L. Bouvy).

http://dx.doi.org/10.1016/j.sapharm.2017.04.014

some primary care practices have embedded a non-dispensing pharmacist (NDP, also: clinical pharmacist or clinical pharmacy specialist).

NDPs in primary care practice conduct clinical pharmacy services (CPS) that primarily focus on chronic disease management. CPS are usually multifaceted, including medication therapy reviews, counselling and medication education. These services can be aimed at patients with a specific chronic condition such as diabetes, cardiovascular disease or COPD ("disease-specific CPS"), or at a more heterogeneous group of patients at risk of drug related problems, such as patients with multimorbidity and polypharmacy ("patient-centered CPS"). Disease-specific CPS focusses on evidence-based protocolled care, while patient-centered CPS entails a more non-standardized and holistic approach.[2]

Some NDPs are fully integrated into the health care team,[3,4] whereas others only temporarily provide a specific CPS.[5] Common opinion is that integrated care for patients with chronic conditions may improve patient outcomes.[6–8] CPS have been shown to positively affect surrogate outcomes, such as blood pressure, glycemic control and lipid goal attainment.[9–13] Evidence of the effect of CPS on clinical endpoints, such as mortality, hospitalizations and health related quality of life, is less clear probably due to very heterogeneously defined CPS as well as strongly differing study settings.[12,14]

Both aspects are features of the degree of integration of the NDP who delivers the CPS. The degree of integration of NDPs into the health care team may be a determinant for its success, but this association has never been properly assessed. Therefore, we conducted a systematic review to investigate how the degree of integration of an NDP impacts health outcomes in primary care.

2. Methods

The protocol of this systematic review has been published in the PROSPERO register. The registration number is: CRD42016017506.[15]

2.1. Search strategy

We searched PubMed and Embase from 1966 to June 2016. A trained librarian, in consultation with researchers, developed a search strategy (Appendix Table 1). Also, we manually searched the reference list of systematic reviews and background articles about clinical pharmacy interventions in primary care for additional citations.

Potentially relevant studies were identified by two reviewers (AH and LB) based on predetermined inclusion criteria in a two-step procedure: 1) title and abstract, 2) screening of the full text. In case disagreement about inclusion could not be resolved by discussion between the two reviewers, a third reviewer (AB or MB) was consulted to reach consensus. We used the PRISMA checklist to conduct and report the systematic literature review.[16]

2.2. Study selection

Both USA and non-USA comparative studies of any design that had a control group or baseline comparison were included if they met the following criteria:

2.3. The intervention

1. comprised at least one key component of a chronic disease management service aimed at individual ambulatory patients;
2. was conducted by an NDP who had a regular and ongoing relationship with the primary care practice and was at least part-time physically present and at that time not involved in work related to community pharmacy;
3. measured a relevant clinical or patient reported health outcome or a proxy of a relevant health outcome (e.g. improvement of medication errors).

Studies were excluded if the intervention was delivered in a specialty or off-site clinic without collaboration with the general practitioner (GP), or if it was a pilot of an already included study or a secondary analysis. Also, unpublished studies and studies published in languages other than English were not taken into account for analysis.

2.4. Dependant variable: degree of integration

Our main focus was the degree of integration of NDPs, which we assessed via key dimensions of integration from the conceptual framework of Walshe and Smith[17]: organizational, informational, clinical, functional, financial and normative integration (Table 1). The financial integration could not be taken into account as most interventions were project funded studies. The key dimensions were scored dichotomous (yes/no). A positive score on zero to two dimensions of integration was defined as "no integration". A positive score on three or four dimensions of integration was defined as "partial integration" and a positive score on all five dimensions was defined as "full integration". Prescriptive authority was taken into account to assess clinical integration, see Table 3.

2.5. Primary outcome: health outcomes

The primary outcomes of the intervention were either real clinical health outcomes, such as mortality, or surrogate clinical health outcomes, such as HbA1c, lipids and blood pressure. In addition to clinical health outcomes, we included patient reported health outcomes, such as health related quality of life and proxies of health outcomes, such as quality of care performance indicators.

2.6. Data collection process

Other extracted data included the duration of the intervention, study size, primary outcomes, specification of the CPS (disease-specific or patient-centered) and the number of involved practices and NDPs. The primary outcomes of the intervention were categorized as either "positive", "negative" or "no effect". A positive outcome was defined as a statistically significant difference (p value < 0.05) compared to the control group or baseline. A negative outcome being the opposite and no effect as no statistically significant difference between intervention and control group or baseline.

Two authors independently extracted the data and one author cross-checked all extracted data. Differences were resolved in discussion. In case of dissensus, a third researcher was consulted. If we were unable to score the dimensions of integration – despite contacting the corresponding author for additional information and verifying complementary study protocols - the study was excluded for synthesis.

2.7. Quality assessment

We used the Effective Public Health Practice Project (EPHPP) Quality Assessment Tool to assess: selection bias, study design, confounders, data collection methods, withdrawals and dropouts. Given the nature of the included studies, blinding of the participants and outcome assessors was generally not possible. Therefore, this criterion was not included in the quality

Please cite this article in press as: Hazen ACM, et al., The degree of integration of non-dispensing pharmacists in primary care practice and the impact on health outcomes: A systematic review, Research in Social and Administrative Pharmacy (2017), http://dx.doi.org/10.1016/j.sapharm.2017.04.014